Deploying WebObjects Applications

Session 709

Deploying WebObjects Applications

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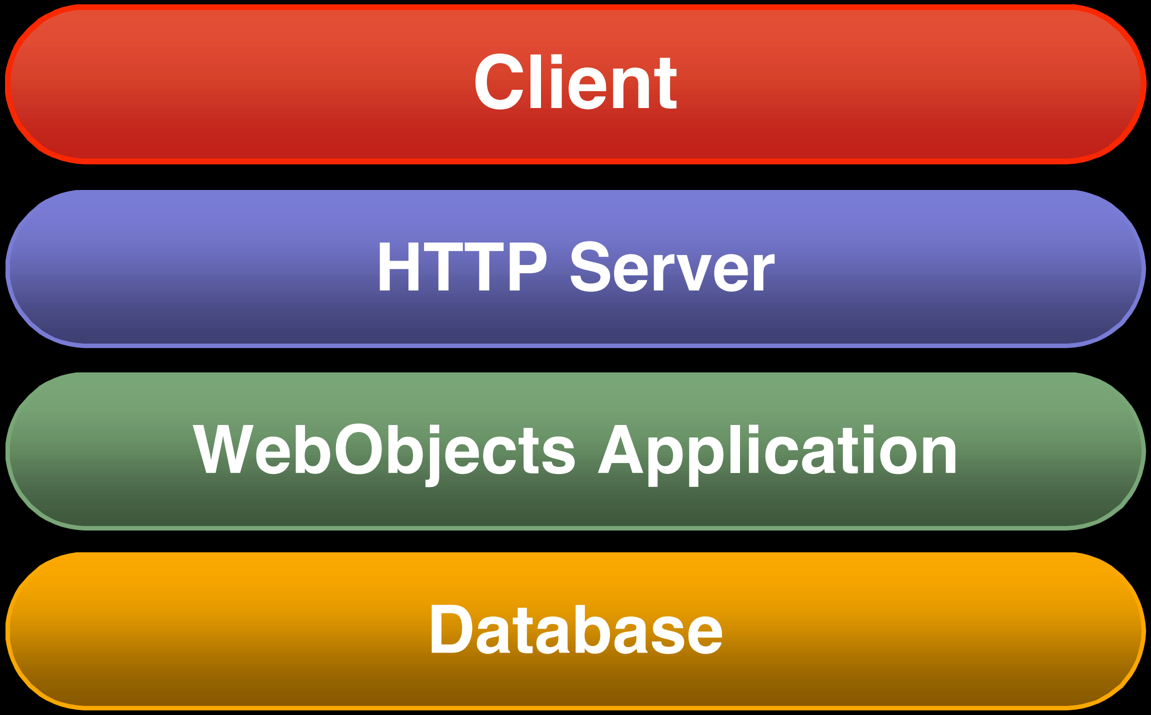
WebObjects Engineering

Introduction

- Deployment overview
- Configuration
- System monitoring
- Typical deployment
- Questions and Answers

Deployment Architecture



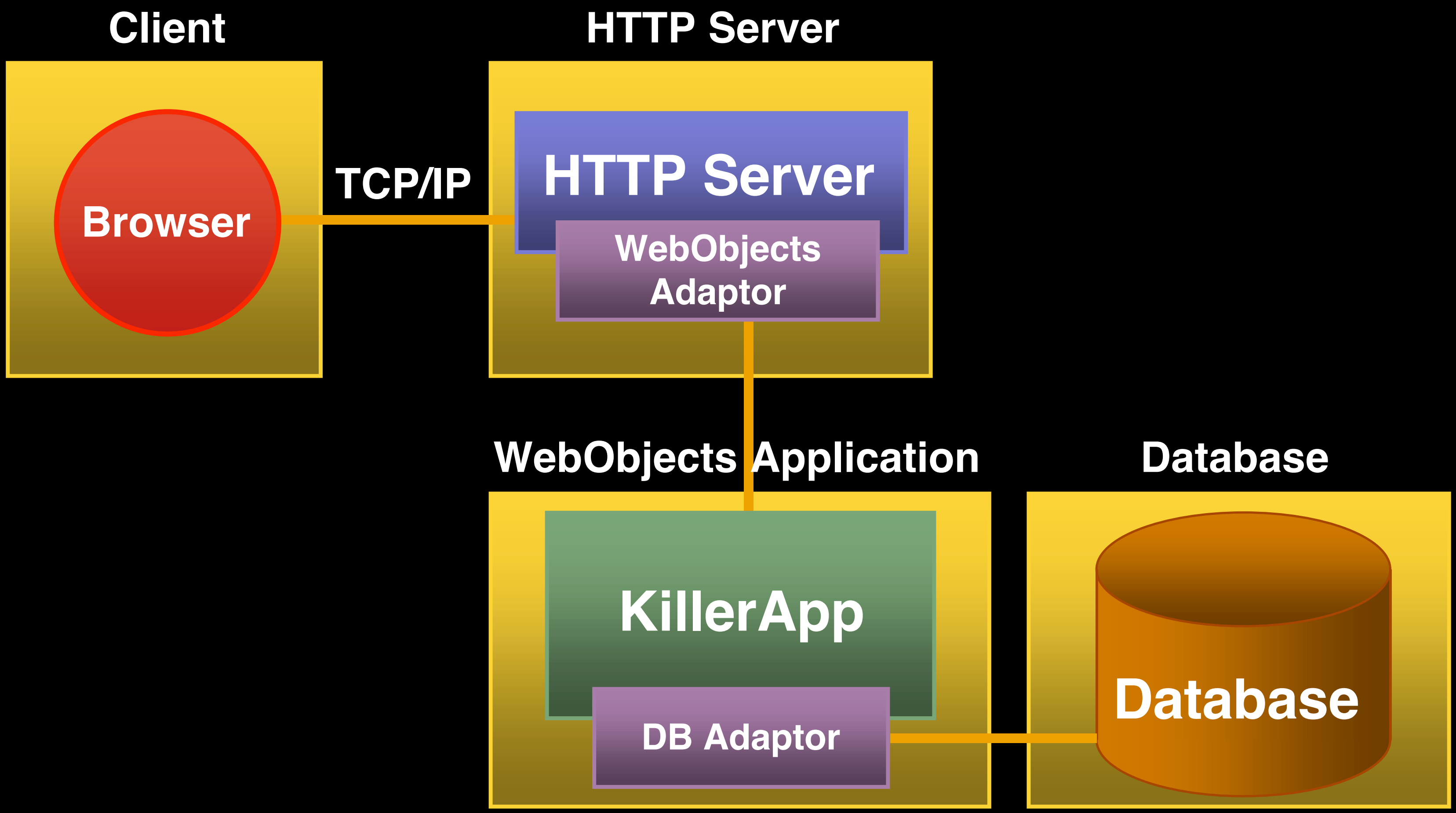
Client

HTTP Server

WebObjects Application

Database

Deployment Architecture



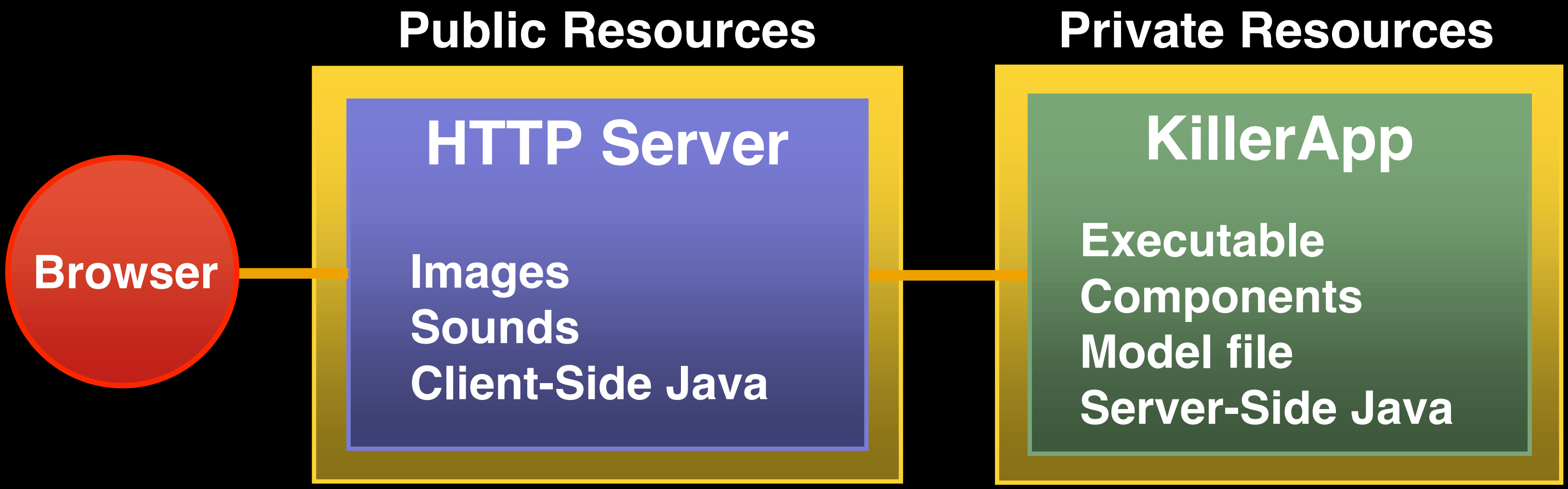
Deployment Methods

- Standard WebObjects Application
  - Can use Monitor and Wotaskd
  - Deploy multiple instances
  - Uses WebObjects HTTP Adaptor
- JSP and Servlet
  - Tomcat
  - WebLogic

See—**710 JSP and Servlet Integration**

Public and Private Resources

Split installation



Deployment Details

Supported deployment platforms

- Mac OS X Server 10.1
- Windows 2000 Server
- Solaris 2.8

Requires JRE 1.3.1 or higher

Deployment Details

Hardware considerations

- Processor capability
- Number of processors
- RAM
- Disk space
- Redundancy

Deployment Details

Location considerations

- Network capacity
- Network security
- Physical security
- Temperature control
- Uninterruptible Power Supply

Deployment Details

Administration considerations

- Account for applications
- Application logging
- Access control

What Can You Control?

Deployment dependant

- WebObjects adaptor
- Application
- Database

WebObjects Adaptor

- Forwards requests from the client to the WebObjects application
- What does it do for me?
  - Better performance
  - Validation of client requests
  - Security

WebObjects Adaptor

- CGI
  - Works everywhere
  - Slow—requires forking a process for each request
  - No load balancing on Windows
- API
  - Apache, NSAPI, and ISAPI plug-ins
  - Fast, but can only be used with specific HTTP servers
  - Supports load balancing
- C source code provided

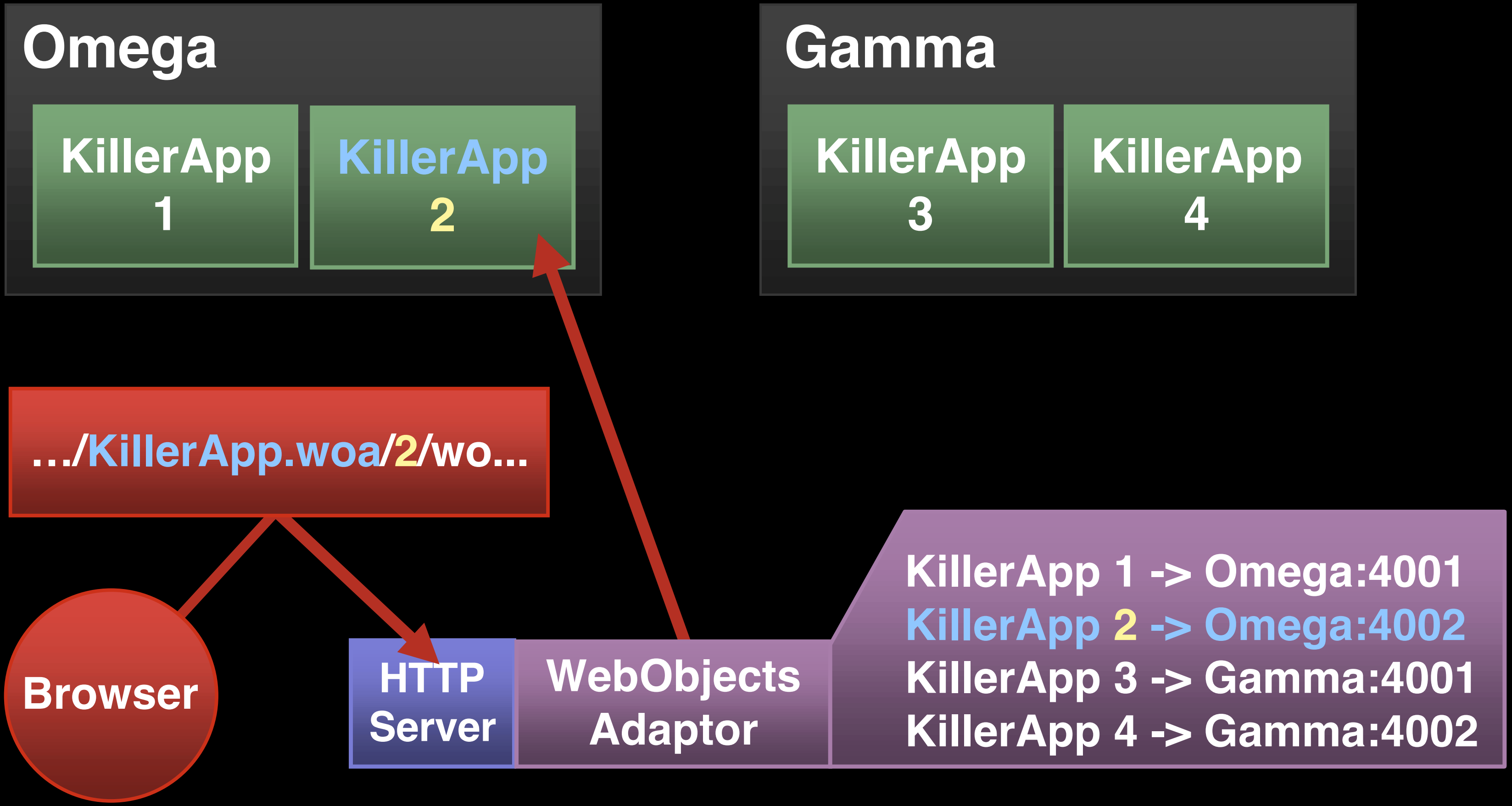
Supported Adaptors

	Mac OS X Server	Solaris	Windows 2000 Server
Apache	●	●	
NSAPI		●	
ISAPI			●
CGI	●	●	●

What Is Load Balancing?

- The distribution of client requests between multiple instances of your application
    - It only load balances requests without sessions
- Types of load balancing
    - Random
    - Round robin (taking turns)
    - Load average

Adaptor Overview



KillerApp 1 -> Omega:4001
KillerApp 2 -> Omega:4002
KillerApp 3 -> Gamma:4001
KillerApp 4 -> Gamma:4002

Adaptor Site Configuration

- Maps application name + instance ID to an application server + port
  - KillerApp 1 ➡ Omega:4001
  - KillerApp 2 ➡ Omega:4002
  - KillerApp 3 ➡ Gamma:4001
  - KillerApp 4 ➡ Gamma:4002
- Additional options
  - Load balancing type
  - Number of persistent connections to the application
  - Socket options

Adaptor Configuration

- Three mechanisms to get configuration
  - Flat File

    file:///Library/WebObjects/Configuration/WOConfig.xml
  - Host List

    http://Gamma:1085,http://Omega:1085
  - Multicast

    webobjects://239.128.14.2:1085
- Updated every 10 seconds by default

Flat File Configuration

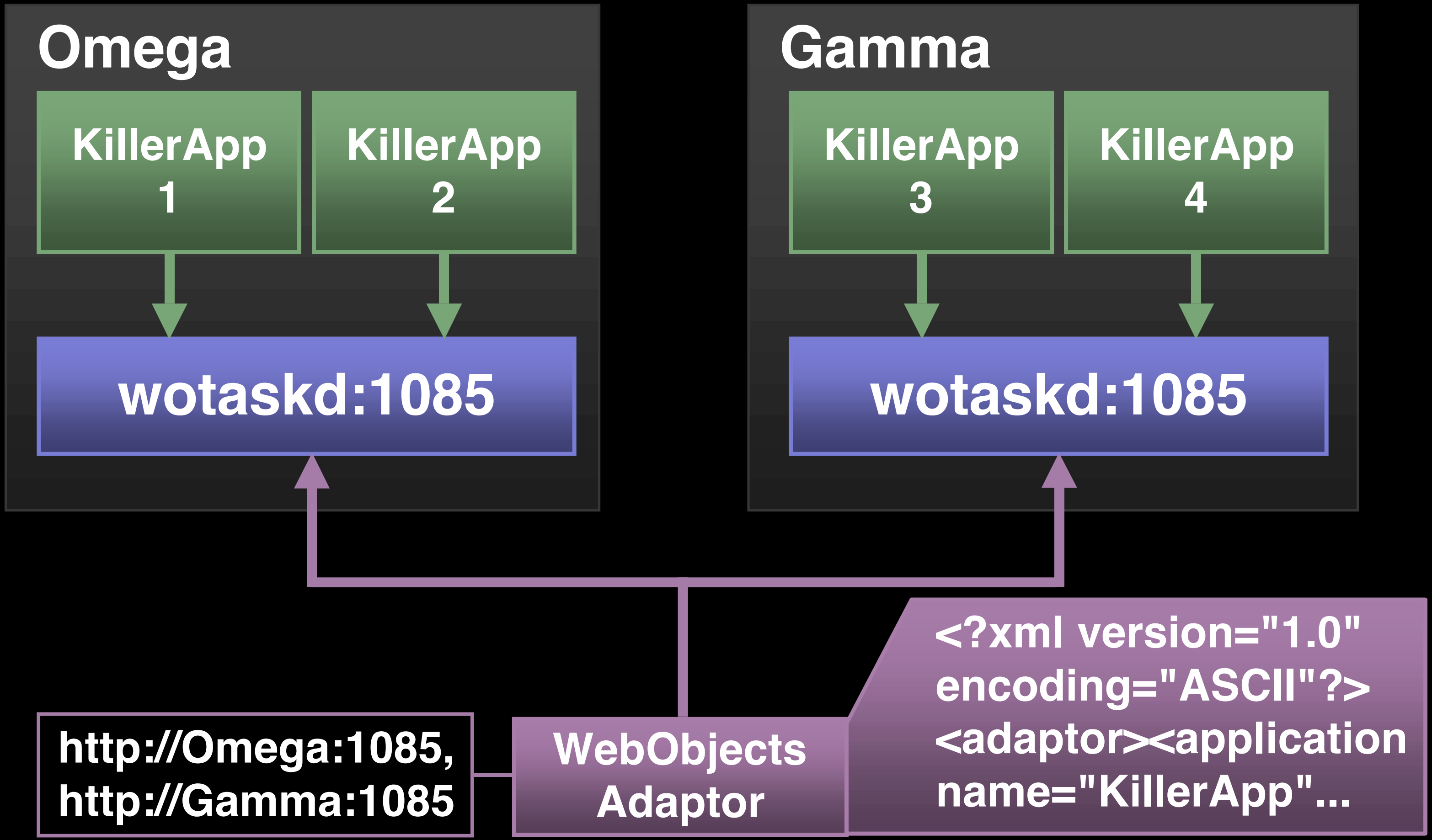
- XML format
- Example in the “*Deploying WebObjects Applications*” book
- Example:

```
<adaptor>
    <application name="KillerApp"
scheduler="ROUNDROBIN">
        <instance id="1" host="Omega"
port="4001"/>
    </application>
</adaptor>
```

Host List Configuration

- Adaptor requests dynamic configuration info from a list of hosts
  - Information supplied by a WebObjects Task Daemon (wotaskd) running on each application host
  - Information supplied in the same XML format as Flat File
  - Allows dynamic addition of application instances on the listed hosts
- Default mechanism for adaptors
  http://localhost:1085

Adaptor and Host List

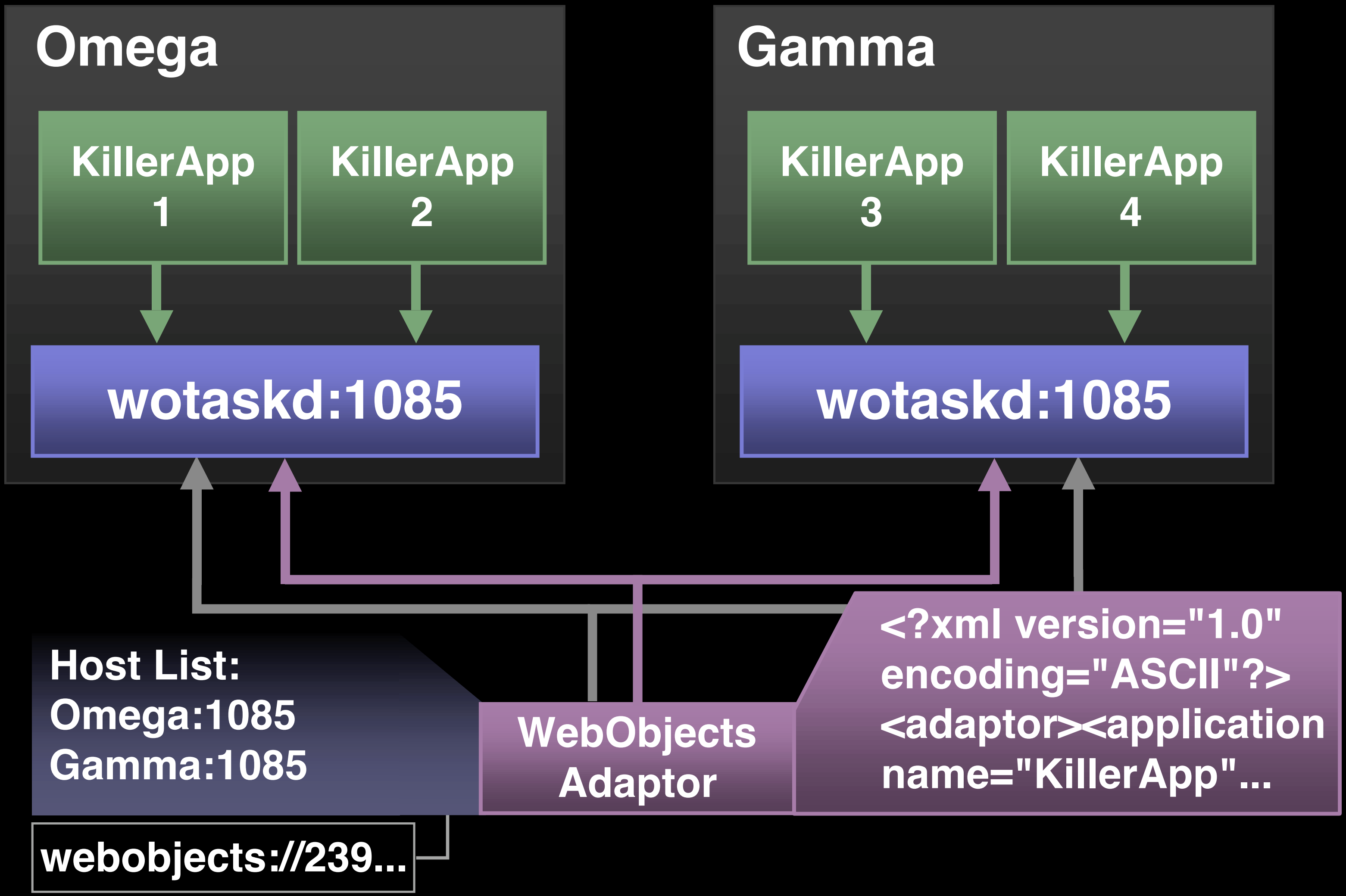


<?xml version="1.0" encoding="ASCII"?> <adaptor><application name="KillerApp"...

Multicast Configuration

- Broadcasts UDP to a specific IP address + port
    - webobjects://239.128.14.2:1085
    - Limited to subnet by default
- Dynamically builds list of available hosts
    - wotaskd(s) respond to the adaptor's multicast query
    - Configuration proceeds exactly like Host List
    - Default host rediscovery is every 100 seconds

Adaptor and Multicast



Omega

KillerApp 1

KillerApp 2

wotaskd:1085

Gamma

KillerApp 3

KillerApp 4

wotaskd:1085

Host List:
Omega:1085
Gamma:1085

WebObjects Adaptor

```
<?xml version="1.0"
encoding="ASCII"?>
<adaptor><application
name="KillerApp"...
```

webobjects://239...

Wotaskd

- Started at boot
- Watched over by a daemon process
- Supplies adaptor with dynamic configuration data
    - XML data is served on port 1085
- Registers running instances on the same machine
- Watches, cycles, and restarts configured instances
- Configured using Monitor

Monitor

- WebObjects application
- Web interface to wotaskd
    - Configure application instances
    - Manage multiple hosts
    - Configure WebObjects adaptor
    - Set up scheduling of instances
- Can be password protected
- Only run one instance of Monitor!

Instance Scheduling

- Each instance can be scheduled independently
    - A scheduled instance is restarted periodically by wotaskd
- Three types of scheduling
    - Hourly
    - Daily
    - Weekly
- Can terminate instances immediately or gracefully

Demo

Monitor

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WebObjects Engineering

Adaptor Info Page

- View adaptor status
  - http://Matilda/cgi-bin/WebObjects/WOAdaptorInfo
  - Detailed configuration information
    - socket connect/send/receive timeout
    - refusing timeout
    - “dead” timeout
  - Links to all available instances
  - Disabled by default, for security reasons
  - Can be password protected or public access

Adaptor Logging

- Enabling adaptor logging
    - Create file named **logWebObjects** in the temp directory
    - Log file named **WebObjects.log** will be generated
    - Logging can be started/stopped without restarting the HTTP server

Instance Configuration

- Standard Java java.util.Properties
  - Properties file from all included frameworks
  - Properties file from application .woa
  - Command-line arguments
- Properties file
  - Named “**Properties**” and located in the .woa or .framework resources directory
  - One property per line, in “**name=value**” format
- Command-line arguments
  - Passed as “**-Dname=value**”

Useful Properties

- WOPort
- WOHost
- WODebuggingEnabled
- WOOutputPath
- WOCachingEnabled
- WOListenQueueSize
- WOAllowsConcurrentRequestHandling
- WOWorkerThreadCountMin
- WOWorkerThreadCountMax

Properties

Configuration

- WOPort <port number>
  - Listen for requests on a specific TCP/IP port
  - Arbitrarily chosen if not set
- WOHost <IP address or hostname>
  - Bind the listen socket to a specific IP address
  - Used only for hosts with multiple IP addresses

Properties

Logging

- WODebuggingEnabled <true/false>
    - Enables some debugging information output
    - See NSLog for details
- WOOutputPath <path>
    - Will redirect debugging output to a specified file
    - Will redirect NSLog

Properties

Performance I

- WOCachingEnabled <true/false>
  - Caches WebObjects components in memory, rather than reading from the filesystem
  - Set true for deployment, false for development
- WOListenQueueSize <count>
  - Number of outstanding requests at any time
  - Defaults to 128
- WOAllowsConcurrentRequestHandling<true/false>
  - Determines whether requests are processed in serial
  - Default is false
  - Requires that your code be thread safe if true!

Properties

Performance II

- WOWorkerThreadCountMin <count>
  - Starting number of threads for processing incoming requests
  - Defaults to 16
- WOWorkerThreadCountMax <count>
  - Maximum number of threads to create for processing incoming requests
  - Defaults to 256
  - Setting it to –1 will allow infinite growth

Potential Bottlenecks

- Application
- Database
- CPU
- Virtual Memory/RAM
- Network

See—**714 Optimizing WebObjects Applications**

Memory/CPU Monitoring Tools

- Mac OS X
    - CPU Monitor
    - Process Viewer
    - vm_stat
- Solaris
    - ps
    - top
- Windows
    - Task Manager

Network Monitoring Tools

- Mac OS X Server
  - Network Utility
- Solaris
  - netstat
- Windows
  - Network Monitor
- Packet Sniffers
  - Hardware
  - tcpdump
  - tcpmonitor

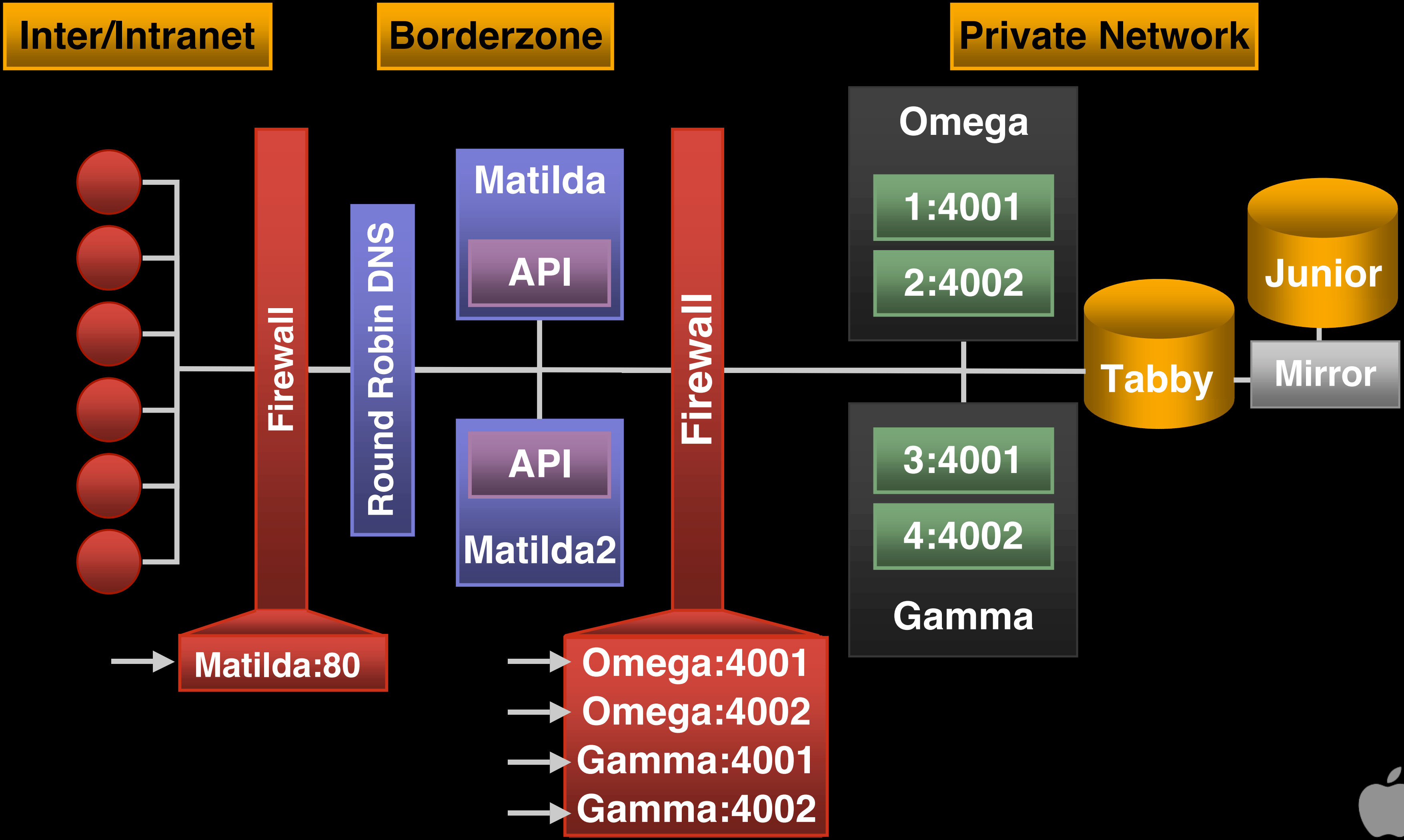
Application Monitoring Tools

- Standard Java tools
    - Jprobe
    - OptimizeIt
- External load generators
    - Playback Manager
    - Silk Performer
- WebObjects frameworks
    - WOEvents
    - WOStats

Typical Deployment

- Deployment principles are the same
  - Small Apps, Home-based
    - Cable or DSL
  - Mid Sized, Small Business
    - Fractional T1
  - Large, Enterprise
    - Multiple T1

Sample Deployment



WebObjects Beta

- To be considered for the beta

  Appleseed.apple.com/webobjects

WebObjects Lab

- Located downstairs in Room L
- Lab hours

Monday	12:00pm–6:00pm
Tuesday	9:00am–2:00pm
Wednesday	9:00am–6:00pm
Thursday	9:00am–6:00pm
Friday	9:00am–6:00pm

Roadmap

710 JSP and Servlet Integration	Room A1 **Thurs., 2:00pm**
714 Optimizing WebObjects Applications	Room A1 **Fri., 10:30am**
FF013 WebObjects	Room A1 **Fri., 3:30pm**

Who to Contact

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http://developer.apple.com/wwdc2002/urls.html

For More Information

- WebObjects Developer Documentation
  http://developer.apple.com/techpubs/webobjects
- Apple Professional Services Technical Support
  www.apple.com/services/technicalsupport
- Other places
  - **www.apple.com/webobjects**
  - **developer.apple.com/webobjects**
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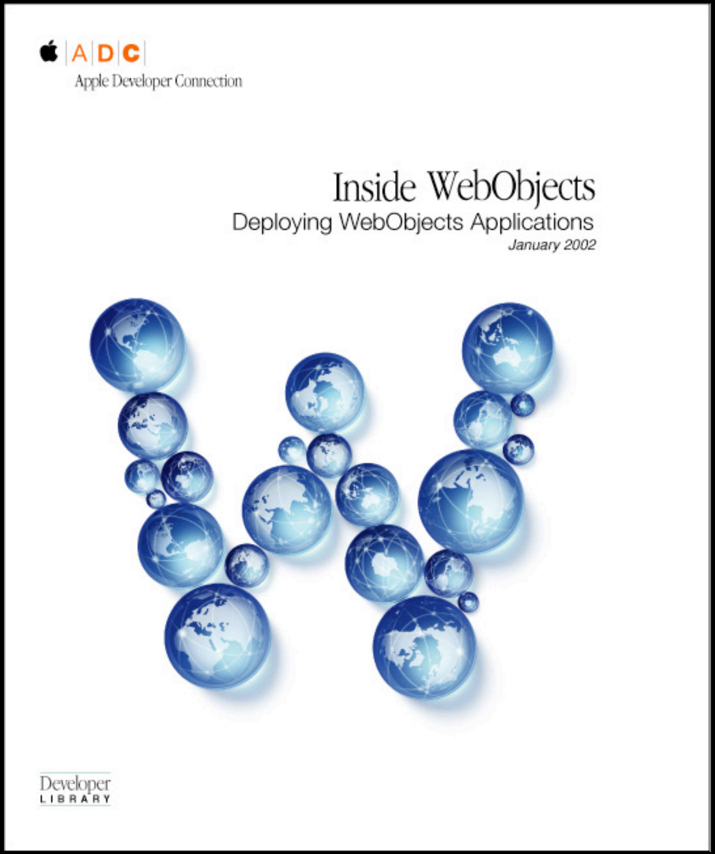
  webobjects-announce@apple.com

Documentation



A D C
Apple Developer Connection

Inside WebObjects
Deploying WebObjects Applications
January 2002

Developer
LIBRARY

- Deploying WebObjects Applications
- Developing Applications Using JavaServer Pages and Servlets
- Monitor and wotaskd
- WebObjects Adaptors

How to Access Documentation

- Most up-to-date: PDF and HTML
  http://developer.apple.com/techpubs/webobjects
- Hardcopy print-on-demand
  Vervante.com under Related Resources
- Product CD
  Documents folder and installed in /Developer/Documentation/WebObjects
- In the box (localized)
  Installation Guides, What's New, WebObjects Overview, Java Client Desktop Applications, Discovering WebObjects for HTML
- Check ADC News for latest updates
  http://developer.apple.com/devnews

Q&A

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http://developer.apple.com/wwdc2002/urls.html

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